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Terms	Documents
DS-CAM or Dscam or "down syndrome cell adhesion molecule"	2

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DB=USPT,PGPB,DWPI; THES=ASSIGNEE; PLUR=YES; OP=OR			
L4	DS-CAM or Dscam or "down syndrome cell adhesion molecule"	2	L4
L3	yamakawa-kazuhiro.in.	3	L3
L2	korenberg-juli?-r.in.	4	L2
L1	korenber-juli?-r.in.	0	L1

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1: Barlow GM, Micales B, Lyons GE, Korenberg JR. Related Articles, Nucleotide, Protein

Down syndrome cell adhesion molecule is conserved in mouse and highly expressed in the adult mouse brain.
Cytogenet Cell Genet. 2001;94(3-4):155-62.
PMID: 11856873 [PubMed - indexed for MEDLINE]

2: Yamakawa K, Huot YK, Haendelt MA, Hubert R, Chen XN, Lyons GE, Korenberg JR. Related Articles, Nucleotide, OMIM, Protein

DSCAM: a novel member of the immunoglobulin superfamily maps in a Down syndrome region and is involved in the development of the nervous system.
Hum Mol Genet. 1998 Feb;7(2):227-37.
PMID: 9426258 [PubMed - indexed for MEDLINE]

3: Agarwala KL, Ganesh S, Amano K, Suzuki T, Yamakawa K. Related Articles, Nucleotide, Protein

DSCAM, a highly conserved gene in mammals, expressed in differentiating mouse brain.
Biochem Biophys Res Commun. 2001 Mar 2;281(3):697-705.
PMID: 11237714 [PubMed - indexed for MEDLINE]

4: Agarwala KL, Nakamura S, Tsutsumi Y, Yamakawa K. Related Articles, Nucleotide, Protein

Down syndrome cell adhesion molecule DSCAM mediates homophilic intercellular adhesion.
Brain Res Mol Brain Res. 2000 Jun 23;79(1-2):118-26.
PMID: 10925149 [PubMed - indexed for MEDLINE]

5: Saito Y, Oka A, Mizuguchi M, Motonaga K, Mori Y, Becker LE, Arima K, Miyauchi J, Takashima S. Related Articles

The developmental and aging changes of Down's syndrome cell adhesion molecule expression in normal and Down's syndrome brains.
Acta Neuropathol (Berl). 2000 Dec;100(6):654-64.
PMID: 11078217 [PubMed - indexed for MEDLINE]

6: Agarwala KL, Ganesh S, Tsutsumi Y, Suzuki T, Amano K, Yamakawa K. Related Articles, Nucleotide, Protein

Cloning and functional characterization of DSCAML1, a novel DSCAM-like cell adhesion molecule that mediates homophilic intercellular adhesion.
Biochem Biophys Res Commun. 2001 Jul 20;285(3):760-72.

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Agarwala KL, Ganesh S, Tsutsumi Y, Suzuki T, Amano K, Yamakawa K.

Laboratory for Neurogenetics, RIKEN Brain Science Institute, Wako-shi, 2-1 Hirosawa, Saitama 351-0198, Japan.

DSCAM, a conserved gene involved in neuronal differentiation, is a member of the Ig superfamily of cell adhesion molecules. Herein, we report the functional characterization of a human DSCAM (Down syndrome cell adhesion molecule) paralogue, DSCAML1, located on chromosome 11q23. The deduced DSCAML1 protein contains 10 Ig domains, six fibronectin-III domains, and an intracellular domain, all of which are structurally identical to DSCAM. When compared to DSCAM, DSCAML1 protein showed 64% identity to the extracellular domain and 45% identity to the cytoplasmic domain. In the mouse brain, DSCAML1 is predominantly expressed in Purkinje cells of the cerebellum, granule cells of the dentate gyrus, and in neurons of the cerebral cortex and olfactory bulb. Biochemical and immunofluorescence analyses indicated that DSCAML1 is a cell surface molecule that targets axonal features in differentiated PC12 cells. DSCAML1 exhibits homophilic binding activity that does not require divalent cations. Based on its structural and functional properties and similarities to DSCAM, we suggest that DSCAML1 may be involved in formation and maintenance of neural networks. The chromosomal locus for DSCAML1 makes it an ideal candidate for neuronal disorders (such as Gilles de la Tourette and Jacobsen syndromes) that have been mapped on 11q23.

PMID: 11453658 [PubMed - indexed for MEDLINE]

1: Cytogenet Cell Genet 2001;94(3-4):155-62

Down syndrome cell adhesion molecule is conserved in mouse and highly expressed in the adult mouse brain.

Barlow GM, Micales B, Lyons GE, Korenberg JR.

Department of Medical Genetics, Cedars-Sinai Medical Center and UCLA, 90048, USA.

Down Syndrome (DS) is a major cause of mental retardation and is associated with characteristic well-defined although subtle brain abnormalities, many of which arise after birth, with particular defects in the cortex, hippocampus and cerebellum. The neural cell adhesion molecule DSCAM (Down syndrome cell adhesion molecule) maps to 21q22.2-->q22.3, a region associated with DS mental retardation, and is expressed largely in the neurons of the central and peripheral nervous systems during development. In order to evaluate the contribution of DSCAM to postnatal morphogenetic and cognitive processes, we have analyzed the expression of the mouse DSCAM homolog, Dscam, in the adult mouse brain from 1 through 21 months of age. We have found that Dscam is widely expressed in the brain throughout adult life, with strongest levels in the cortex, the mitral and granular layers of the olfactory bulb, the granule cells of the dentate gyrus and the pyramidal cells of the CA1, CA2 and CA3 regions, the ventroposterior lateral nuclei of the thalamus, and in the Purkinje cells of the cerebellum. Dscam is also expressed ventrally in the adult spinal cord. Given the homology of DSCAM to cell adhesion molecules involved in development and synaptic plasticity, and its demonstrated role in axon guidance, we propose that DSCAM overexpression contributes not only to the structural defects seen in these regions of the DS brain, but also to the defects of learning and memory seen in adults with DS. Copyright 2002 S. Karger AG, Basel

PMID: 11856873 [PubMed - indexed for MEDLINE]

1: Hum Mol Genet 1998 Feb;7(2):227-37

DSCAM: a novel member of the immunoglobulin superfamily maps in a Down syndrome region and is involved in the development of the nervous system.

Yamakawa K, Huot YK, Haendelt MA, Hubert R, Chen XN, Lyons GE, Korenberg JR.

Division of Medical Genetics, Cedars-Sinai Research Institute/UCLA, Los Angeles, CA 90048-1869, USA.

Down syndrome (DS), a major cause of mental retardation, is characterized by subtle abnormalities of cortical neuroanatomy, neurochemistry and function. Recent work has shown that chromosome band 21q22 is critical for many of the neurological phenotypes of DS. A gene, DSCAM (Down syndrome cell adhesion molecule), has now been isolated from chromosome band 21q22.2-22.3. Homology searches indicate that the putative DSCAM protein is a novel member of the immunoglobulin (Ig) superfamily that represents a new class of neural cell adhesion molecules. The sequence of cDNAs indicates alternative splicing and predicts two protein isoforms, both containing 10 Ig-C2 domains, with nine at the N-terminus and the tenth located between domains 4 and 5 of the following array of six fibronectin III domains, with or without the following transmembrane and intracellular domains. Northern analyses reveals the transcripts of 9.7, 8.5 and 7.6 kb primarily in brain. These transcripts are differentially expressed in substructures of the adult brain. Tissue in situ hybridization analyses of a mouse homolog of the DSCAM gene revealed broad expression within the nervous system at the time of neuronal differentiation in the neural tube, cortex, hippocampus, medulla, spinal cord and most neural crest-derived tissues. Given its location on chromosome 21, its specific expression in the central nervous system and neural crest, and the homologies to molecules involved in neural migration, differentiation, and synaptic function, we propose that DSCAM is involved in neural differentiation and contributes to the central and peripheral nervous system defects in DS.

PMID: 9426258 [PubMed - indexed for MEDLINE]

1: Biochem Biophys Res Commun 2001 Mar 2;281(3):697-705

DSCAM, a highly conserved gene in mammals, expressed in differentiating mouse brain.

Agarwala KL, Ganesh S, Amano K, Suzuki T, Yamakawa K.

Laboratory for Neurogenetics, RIKEN Brain Science Institute, Wako-shi, Saitama, 351-0198, Japan.

Down Syndrome Cell Adhesion molecule (DSCAM) is a member of the immunoglobulin superfamily, and represents a novel class of neuronal cell adhesion molecules. In order to understand the cellular functions of DSCAM, we isolated full-length mouse and human cDNA clones, and analysed its expression during mouse development and differentiation. Sequence analysis of the human DSCAM cDNA predicted at least 33 exons that are distributed over 840 kb. When compared to human DSCAM, the mouse homologue showed 90 and 98% identity at the nucleotide and amino acid levels, respectively. In mouse, DSCAM is located on 16C, the syntenic region for human chromosome band 21q22 and also the region duplicated in mouse DS models. DSCAM gene is predicted to encode an approximately 220-kDa protein, and its expression shows dynamic changes that correlate with neuronal differentiation during mouse development. Our results suggest that DSCAM may play critical roles in the formation and maintenance of specific neuronal networks in brain. Copyright 2001 Academic Press.

PMID: 11237714 [PubMed - indexed for MEDLINE]

1: Brain Res Mol Brain Res 2000 Jun 23;79(1-2):118-26

ELSEVIER SCIENCE FULL-TEXT ARTICLE

Down syndrome cell adhesion molecule DSCAM mediates homophilic intercellular adhesion.

Agarwala KL, Nakamura S, Tsutsumi Y, Yamakawa K.

Laboratory for Neurogenetics, Brain Science Institute, Institute of Physical and Chemical Research (RIKEN), Saitama, Japan.

Down Syndrome (DS) caused by trisomy 21 is the most common birth defect associated with mental retardation. Recently, a novel gene named, DSCAM, has been identified in the DS critical region. DSCAM is predicted to be a transmembrane protein with a very high structural and sequence homology to Ig superfamily of cell adhesion molecules and is expressed in the developing nervous system with the highest level in fetal brain. Diverse glycoproteins of cell surfaces and extracellular matrices operationally termed as 'adhesion molecule' are important in the specification of cell interactions during development, maintenance and regeneration of the nervous system. To understand the cellular function of DSCAM protein, we transfected human DSCAM cDNA into mouse fibroblast L cells and analysed its expression. On Western blot analysis, antibodies raised against recombinant DSCAM-Ig3 recognized a 198 kDa protein band in the membrane fraction of DSCAM transfected L cells. Stable transformants expressing DSCAM showed uniform surface expression. DSCAM-expressing transfectants exhibited enhanced adhesive properties, aggregating with faster kinetics and forming aggregates in a homophilic manner. Divalent cations are not required for this cell aggregation. These results demonstrate that DSCAM is a cell adhesion molecule that can mediate cation-independent homophilic binding activity between DSCAM expressing cells.

PMID: 10925149 [PubMed - indexed for MEDLINE]

1: Acta Neuropathol (Berl) 2000 Dec;100(6):654-64

The developmental and aging changes of Down's syndrome cell adhesion molecule expression in normal and Down's syndrome brains.

Saito Y, Oka A, Mizuguchi M, Motonaga K, Mori Y, Becker LE, Arima K, Miyauchi J, Takashima S.

Department of Clinical Laboratory, National Center Hospital for Mental, Nervous and Muscular Disorders, National Center of Neurology and Psychiatry, Kodaira, Tokyo, Japan.

We studied the expression of Down's syndrome cell adhesion molecule (DSCAM) in Down's syndrome (DS) and control brains, using antisera against peptide fragments of DSCAM. On Western blots of human, mouse and rat brain homogenates, the antisera recognized a product at approximately 200 kDa. In the brain of a 2-year-old patient with DS, Western blotting revealed an overexpression of DSCAM compared to an age-matched control. Immunohistochemistry demonstrated DSCAM in the cerebral and cerebellar white matter of both control and DS subjects, in accordance with the temporal and spatial sequence of myelination. In DS brains, immunoreactivity for DSCAM, compared to that for controls, was enhanced in the Purkinje cells at all ages, and in the cortical neurons during adulthood. In demented DS patients, DSCAM immunoreactivity was observed in the core and periphery of senile plaques. The pattern of DSCAM expression suggests that it may play a role as an adhesion molecule regulating myelination. The overexpression of DSCAM may also play a role in the mental retardation and the precocious dementia of DS patients, although the mechanism of neuronal dysfunction is undetermined.

PMID: 11078217 [PubMed - indexed for MEDLINE]

1: Biochem Biophys Res Commun 2001 Jul 20;285(3):760-72

IDEAL

Cloning and functional characterization of DSCAML1, a novel DSCAM-like cell adhesion molecule that mediates homophilic intercellular adhesion.

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Laboratory for Neurogenetics, RIKEN Brain Science Institute, Wako-shi, 2-1 Hirosawa, Saitama 351-0198, Japan.

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PMID: 11453658 [PubMed - indexed for MEDLINE]

☐1: NM_001389. Homo sapiens Down...[gi:20127421]

Related Sequences, OMIM, Protein, PubMed, Taxonomy, UniSTS, LinkOut

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  TITLE     DSCAM: a novel member of the immunoglobulin superfamily maps in a
            Down syndrome region and is involved in the development of the
            nervous system
  JOURNAL   Hum. Mol. Genet. 7 (2), 227-237 (1998)
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  JOURNAL   Nature 405 (6784), 311-319 (2000)
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REFERENCE   3  (bases 1 to 6649)
  AUTHORS   Agarwala,K.L., Nakamura,S., Tsutsumi,Y. and Yamakawa,K.
  TITLE     Down syndrome cell adhesion molecule DSCAM mediates homophilic
            intercellular adhesion
  JOURNAL   Brain Res. Mol. Brain Res. 79 (1-2), 118-126 (2000)
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Revised: October 24, 2001.

1: NP_001380. Down syndrome cel...[gi:20127422]

BLink, Nucleotide, Related Sequences, PubMed, Taxonomy, LinkOut

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DEFINITION  Down syndrome cell adhesion molecule; human CHD2-52 down syndrome
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VERSION     NP_001380.2  GI:20127422
DBSOURCE    REFSEQ: accession NM_001389.2
KEYWORDS    .
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            Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
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REFERENCE   1  (residues 1 to 2012)
  AUTHORS   Yamakawa,K., Huot,Y.K., Haendelt,M.A., Hubert,R., Chen,X.N.,
            Lyons,G.E. and Korenberg,J.R.
  TITLE     DSCAM: a novel member of the immunoglobulin superfamily maps in a
            Down syndrome region and is involved in the development of the
            nervous system
  JOURNAL   Hum. Mol. Genet. 7 (2), 227-237 (1998)
  MEDLINE   98087574
   PUBMED   9426258
REFERENCE   2  (residues 1 to 2012)
  AUTHORS   Hattori,M., Fujiyama,A., Taylor,T.D., Watanabe,H., Yada,T.,
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  TITLE     The DNA sequence of human chromosome 21
  JOURNAL   Nature 405 (6784), 311-319 (2000)
  MEDLINE   20289799
   PUBMED   10830953
REFERENCE   3  (residues 1 to 2012)
  AUTHORS   Agarwala,K.L., Nakamura,S., Tsutsumi,Y. and Yamakawa,K.
  TITLE     Down syndrome cell adhesion molecule DSCAM mediates homophilic
            intercellular adhesion
  JOURNAL   Brain Res. Mol. Brain Res. 79 (1-2), 118-126 (2000)
  MEDLINE   20384934
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Revised: October 24, 2001.

☐1: AAC17967. Down syndrome cel...[gi:3169768]

BLink, Nucleotide, OMIM, Related Sequences, PubMed, Taxonomy, LinkOut

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  AUTHORS   Yamakawa,K., Huot,Y.K., Haendelt,M.A., Hubert,R., Chen,X.N.,
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  TITLE     DSCAM: a novel member of the immunoglobulin superfamily maps in a
            Down syndrome region and is involved in the development of the
            nervous system
  JOURNAL   Hum. Mol. Genet. 7 (2), 227-237 (1998)
  MEDLINE   98087574
   PUBMED   9426258
REFERENCE   2  (residues 1 to 1571)
  AUTHORS   Yamakawa,K., Huo,Y.-K., Haendel,M.A., Hubert,R., Chen,X.-N.,
            Lyons,G.E. and Korenberg,J.R.
  TITLE     Direct Submission
  JOURNAL   Submitted (08-SEP-1997) Medical Genetics, Cedars-Sinai Research
            Institute, 110 George Burns Road, Davis Building, Suite 2005, Los
            Angeles, CA 90048-1869, USA
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1381 dqprltvskt tsssitlswl pgdnggssir gyilqysedn seqwgsfpis psersyrlen
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Revised: October 24, 2001.

1: O60469. Down syndrome cel...[gi:12643619]

BLink, OMIM, Related Sequences, PubMed, Taxonomy, LinkOut

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LOCUS       DSCA_HUMAN              2012 aa            linear   PRI 01-MAR-2002
DEFINITION  Down syndrome cell adhesion molecule precursor (CHD2).
ACCESSION   O60469
PID         g12643619
VERSION     O60469  GI:12643619
DBSOURCE    swissprot: locus DSCA_HUMAN, accession O60469;
            class: standard.
            extra accessions:O60468,created: Oct 16, 2001.
            sequence updated: Oct 16, 2001.
            annotation updated: Mar 1, 2002.
            xrefs: gi: gi: 3169767, gi: gi: 3169768, gi: gi: 3169765, gi: gi:
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            7717375
            xrefs (non-sequence databases): MIM 602523, InterPro IPR003961,
            InterPro IPR003962, InterPro IPR003006, InterPro IPR003598,
            InterPro IPR003600, Pfam PF00041, Pfam PF00047, PRINTS PR00014,
            SMART SM00060, SMART SM00410, SMART SM00408
KEYWORDS    Immunoglobulin domain; Glycoprotein; Signal; Cell adhesion; Repeat;
            Transmembrane; Alternative splicing.
SOURCE      human.
  ORGANISM  Homo sapiens
            Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
            Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
REFERENCE   1  (residues 1 to 2012)
  AUTHORS   Yamakawa,K., Huot,Y.K., Haendelt,M.A., Hubert,R., Chen,X.N.,
            Lyons,G.E. and Korenberg,J.R.
  TITLE     DSCAM: a novel member of the immunoglobulin superfamily maps in a
            Down syndrome region and is involved in the development of the
            nervous system
  JOURNAL   Hum. Mol. Genet. 7 (2), 227-237 (1998)
  MEDLINE   98087574
  REMARK    SEQUENCE FROM N.A., AND ALTERNATIVE SPLICING.
            TISSUE=Brain
REFERENCE   2  (residues 1 to 2012)
  AUTHORS   Agarwala,K.L., Nakamura,S., Tsutsumi,Y. and Yamakawa,K.
  TITLE     Down syndrome cell adhesion molecule DSCAM mediates homophilic
            intercellular adhesion
  JOURNAL   Brain Res. Mol. Brain Res. 79 (1-2), 118-126 (2000)
  MEDLINE   20384934
  REMARK    SEQUENCE FROM N.A., AND FUNCTION.
REFERENCE   3  (residues 1 to 2012)
  AUTHORS   Hattori,M., Fujiyama,A., Taylor,T.D., Watanabe,H., Yada,T.,
            Park,H.-S., Toyoda,A., Ishii,K., Totoki,Y., Choi,D.-K., Soeda,E.,
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            Yaspo,M.-L.
  TITLE     The DNA sequence of human chromosome 21
  JOURNAL   Nature 405 (6784), 311-319 (2000)
  MEDLINE   20289799
  REMARK    SEQUENCE FROM N.A.
COMMENT     ---------------------------------------------------------------------
            This SWISS-PROT entry is copyright. It is produced through a
            collaboration between the Swiss Institute of Bioinformatics and
            the EMBL outstation - the European Bioinformatics Institute.
            The original entry is available from http://www.expasy.ch/sprot
            and http://www.ebi.ac.uk/sprot
            ---------------------------------------------------------------------.
            [FUNCTION] CELL ADHESION MOLECULE THAT CAN MEDIATE
            CATION-INDEPENDENT HOMOPHILIC BINDING ACTIVITY. COULD BE INVOLVED
            IN NERVOUS SYSTEM DEVELOPMENT.
            [SUBCELLULAR LOCATION] TYPE I MEMBRANE PROTEIN (PROBABLE). THE
            SHORT ISOFORM MAY BE SECRETED.
            [ALTERNATIVE PRODUCTS] 2 ISOFORMS; A LONG FORM/CHD2-52 (SHOWN HERE)
            AND A SHORT FORM/CHD2-42; ARE PRODUCED BY ALTERNATIVE SPLICING.
            [TISSUE SPECIFICITY] PRIMARILY EXPRESSED IN BRAIN.
            [SIMILARITY] BELONGS TO THE IMMUNOGLOBULIN SUPERFAMILY.
            [SIMILARITY] CONTAINS 10 IMMUNOGLOBULIN-LIKE C2-TYPE DOMAINS.
            [SIMILARITY] CONTAINS 6 FIBRONECTIN TYPE III-LIKE DOMAINS.
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                      /db_xref="taxon:9606"
                      1..2012
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                      /note="EXTRACELLULAR (POTENTIAL)."
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     Region           239..300
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 541 snllpfnhrq vafenngtlk lsdvqkevde geytcnvlvq pqlstsqsvh vtvkvppfiq
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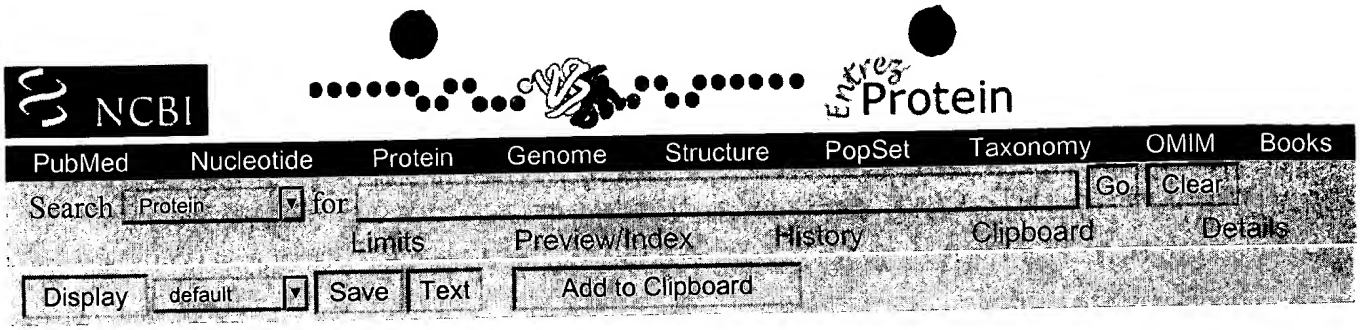
Revised: October 24, 2001.



☐1: AAC17966. Down syndrome cel...[gi:3169766]

BLink, Nucleotide, OMIM, Related Sequences, PubMed, Taxonomy, LinkOut

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LOCUS       AAC17966                1896 aa            linear   PRI 30-MAR-2001
DEFINITION  Down syndrome cell adhesion molecule [Homo sapiens].
ACCESSION   AAC17966
PID         g3169766
VERSION     AAC17966.1  GI:3169766
DBSOURCE    locus AF023449 accession AF023449.1
KEYWORDS    .
SOURCE      human.
  ORGANISM  Homo sapiens
            Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
            Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
REFERENCE   1  (residues 1 to 1896)
  AUTHORS   Yamakawa,K., Huot,Y.K., Haendelt,M.A., Hubert,R., Chen,X.N.,
            Lyons,G.E. and Korenberg,J.R.
  TITLE     DSCAM: a novel member of the immunoglobulin superfamily maps in a
            Down syndrome region and is involved in the development of the
            nervous system
  JOURNAL   Hum. Mol. Genet. 7 (2), 227-237 (1998)
  MEDLINE   98087574
   PUBMED   9426258
REFERENCE   2  (residues 1 to 1896)
  AUTHORS   Yamakawa,K., Huo,Y.-K., Haendel,M.A., Hubert,R., Chen,X.-N.,
            Lyons,G.E. and Korenberg,J.R.
  TITLE     Direct Submission
  JOURNAL   Submitted (08-SEP-1997) Medical Genetics, Cedars-Sinai Research
            Institute, 110 George Burns Road, Davis Building, Suite 2005, Los
            Angeles, CA 90048-1869, USA
COMMENT     Method: conceptual translation.
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                     /note="derived from alternately-spliced mRNA"
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                     /note="member of immunoglobulin superfamily; involved in
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      181 yrcitrhryt getrqsnsar lfvsdpansa psildgfdhr kamagqrvel pckalghpep
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Revised: October 24, 2001.